

We claim:

- 1 1. ~~A method of format detection for information received over a communication system, the method comprising the step of:~~  
2       determining the format of the received information by decoding received  
3 information extracted from a defined guiding channel whereby information size values  
4 obtained from a defined list of size values for the guiding channel is used in the  
5 decoding.  
6
- 1 2. The method of claim 1 where the step of determining the format comprises the  
2 steps of:  
3       providing a lookup table to store the information size values of the guiding  
4 channel and corresponding information size values of other channels of the  
5 communication system;  
6       extracting received information from the other communication channels;  
7       performing decoding operations on the extracted guiding channel information M  
8 times where M is an integer that represents a total number of information size values  
9 stored in the list;  
10      deciding which of the M decoding operations resulted in a correct decode; and  
11      determining the format of the received information from the information size  
12 value of the guiding channel that yielded the correct decode.
- 1 3. The method of claim 2 where the step of deciding which of the M decoding  
2 operations resulted in a correct decode comprises the steps of:  
3       performing at least one decode operation on the extracted guiding channel  
4 information yielding at least one decode result; and  
5       applying the at least one decode result to an algorithm for deciding whether  
6 there is a correct decode and which information size value yielded such correct  
7 decode.
- 2 4. The method of claim 3 where the communication system is a 3GPP compliant  
UMTS where the guiding channel is TrCh1 and the decoding operations comprise

3 convolutional decoding yielding a result on which a tail bit test and CRC decoding are  
4 performed whereby each such operation is performed M times.

1 5. The method of claim 4 where the format being determined are transport formats of  
2 TrCh2 and TrCh3 based on a format detected for TrCh1.

1 6. The method of claim 4 where the decoding operations yield decoding results that  
2 are used in the algorithm to decide the correct decode where the CRC decoding for the  
3  $i^{\text{th}}$  operation yields a value  $C_i$ , and the tail bit test yields values  $T_i$  and  $K_i$  where  $i$  is  
4 any integer equal to M or less and whereby

5 (a)  $C_i = 1$  indicates a CRC pass;

6 (b)  $C_i = 0$  indicates a CRC fail;

7 (c)  $T_i$  is an integer value that represent a total number of "1" bits occurring in the  
8 tail bits of the convolutional decoding result and further,  $T_0$  is a defined  
9 threshold value that is an integer equal to 1 or greater.

10 (d)  $K_i = 1$  indicates a tail bit test pass condition where  $T_i \leq T_0$ ; and

11 (e)  $K_i = 0$  indicates a tail bit test fail;

1 7. The method of claim 6 where a correct decode is declared when any one of the  
2 following conditions occurs from one of the M decoding operations:

3 (a) only one of the decoding operations yielded in a CRC pass;

4 (b) none of the decoding operations yielded a CRC pass, and of these, only one  
5 passed the tail bit test;

6 (c) none of the decoding operations yielded a CRC pass, but more than one passed  
7 the tail bit test, and of these, only one satisfies the condition  $T_i = T_0$ ;

8 (d) none of the decoding operations yielded a CRC pass, but more than one  
9 passed the tail bit test, and of these, only one satisfies the condition  $T_i < T_0$ ;

10 (e) More than one decoding operation yielded a CRC pass, but none passed the  
11 tail bit test, and of these, only one satisfies the condition  $T_i = T_0 + 1$ ;

12 (f) More than one decoding operation yielded a CRC pass and passed the tail bit  
13 test, but only one of these satisfy the condition  $T_i < T_0$ ;

14 (g) More than one decoding operation yielded a CRC pass, and of these, only one  
15 passed the tail bit test; and  
16 (h) More than one decoding operation yielded a CRC pass and passed the tail bit  
17 test, but only one satisfies the condition  $T_i = T_0$ .

1 8. The method of claim 6 where a BTFD failure is declared when any one of the  
2 following sets of values or conditions occur from at least one of the M decoding  
3 operations:

4 (a) none of the M decoding operations yielded either a CRC pass or a tail bit test  
5 pass result;  
6 (b) none of the M decoding operations yielded a CRC pass, but more than one  
7 passed the tail bit test and none of these satisfy the condition  $T_i = T_0$  condition;  
8 (c) none of the M decoding operations yielded a CRC pass but more than one  
9 passed the tail bit test, and of these, more than one decoding operation yielded  
10 the values  $C_i = 0$ ;  $K_i = 1$ ;  $T_i = T_0$ ;  
11 (d) none of the M decoding operations yielded a CRC pass, but more than one  
12 passed the tail bit test, and of these, more than one yielded values of  $C_i = 0$ ;  
13  $K_i = 1$ ;  $T_i < T_0$ ;  
14 (e) more than one of the M decoding operations yielded a CRC pass, but none  
15 passed the tail bit test, and of these, none satisfy the condition  $T_i = T_0 + 1$ ;  
16 (f) more than one of the M decoding operations yielded a CRC pass, but none  
17 passed the tail bit test, and of these, more than one yielded the values  $C_i = 1$ ;  
18  $K_i = 1$ ;  $T_i = T_0 + 1$ ;  
19 (g) more than one of the M decoding operations yielded values of  $C_i = 1$ ;  $K_i = 1$ ;  
20  $T_i < T_0$ ;  
21 (h) more than one of the decoding operations yielded a CRC pass and a tail bit  
22 pass result, and of these, none satisfy the conditions  $T_i < T_0$  or  $T_i = T_0$ ; and  
23 (i) more than one of the decoding operations yielded a CRC pass and a tail bit  
24 test pass result, and of these, more than one yielded values of  $C_i = 1$ ;  $K_i = 1$ ;  
25  $T_i = T_0$